

Summary of Workshop 7: Laboratory Focused Health Systems Research

Facilitator: Steve Teutsch, M.D.
Epidemiology Program Office
Centers for Disease Control and Prevention
Atlanta, Georgia

CDC Liaison: Steven J. Steindel, Ph.D.

Key Questions:

- 1) What can be done within our present system of delivering laboratory services to improve patient outcomes?
- 2) What can be done in the future to design better systems to achieve higher quality laboratory services?"

The Workshop on Laboratory Focused Health Systems Research had the objectives of:

- facilitating a discussion of the delivery of quality laboratory services in primary, secondary and tertiary care settings;
- developing strategies that demonstrate the differences in patient outcomes that are related to laboratory service delivery in the various settings; and
- identifying strategies for identifying and collecting data that measure changes in quality of patient care as it relates to changes in cost, availability, and quality of laboratory services.

Following is a summary of the discussions that occurred amongst the 30 participants who attended the workshop. As noted in the Institute guidelines, this summary does not represent a consensus document, but does

enumerate the significant points raised in the session.

A goal of the Workshop was answering the questions:

"What can be done within our present system of delivering laboratory services to improve patient outcomes?"

"What can be done in the future to design better systems to achieve higher quality laboratory services?"

Kathleen C. Aller presented an overview discussion of "Health care Information Systems: Foundations for Future Research" that described the present state and future direction of computerized information in today's health care system. William M. Tierney, M.D. followed with a talk on "Deploying Information Technologies for Better Laboratory Use and Patient Outcomes: A 20 Year Odyssey at One Academic Medical Center" that showed how a unified medical information system can

directly affect changes in the practices of patient care delivery. Christine Diehl spoke on "Hospital Systems that put Patients at Risk" which addressed strategies that a large health care delivery system, Columbia/HCA, is implementing the laboratory area to insure cost-effective quality laboratory medicine. Jay M. McDonald, M.D. closed the formal session with a talk on the "Role of the Laboratory Professional - New Opportunities," where he described the extended laboratory of the future and how it reaches out across laboratory disciplines and testing locations using integrated computer systems.

We noted that the opportunity exists for laboratory professionals to move outside both the physical and metaphysical walls that have isolated them and become an integral part of the health care delivery team. To achieve the required paradigm shift, laboratory professionals must move from their present reactive mode and take a proactive position in the health care community.

Our discussion group felt a need to clearly define the role of the laboratory professional in today's system. From that definition, they could then develop a vision of future roles. Changes required in moving toward the future role would help define a future research agenda.

Present Role of Laboratory Professionals:

1. Run Laboratory Tests: Today the laboratory professional has a direct role in the actual performance of tests. However, the role extends much further than the production of a result. It involves the development of quality control and quality assurance systems that maintain a continual level of performance

required by co-workers in the health care system.

2. Deliver Results: The number of laboratory tests ordered within the health care system has led to the development of expertise within the laboratory community in the computerized delivery of medical information. That knowledge has placed laboratory professionals in pivotal positions in the computerization of health care delivery.
3. Selection of Tests: Laboratory professionals directly and indirectly influence the selection of tests made available to clinicians. They directly influence the selection of tests when they serve in the consultant role, which can occur directly on request by a clinician, or indirectly through computerized guidelines such as those developed by Dr. Tierney. They indirectly influence the selection of tests by making readily available to the clinical community only those tests that they feel are effective.
4. Convert Data into Information: A laboratory result in itself is simply data and its utility lies in the conversion of that data into information that the clinician can use. A simple way of converting the data into information is through the use of normal or reference ranges established by laboratory professionals and then used by clinicians as interpretative guidelines. More complex conversion tools include reflex testing algorithms that

can automatically triage laboratory work-up in both a time and cost-effective fashion, and integration of laboratory and other clinical data, especially from the pharmacy, to warn of or interpret changes in a patient's condition. While the complex conversion tools can have manual implementation, they generally involve automated, computerized systems, sometimes linking multiple clinical areas.

5. Technology Assessment: Assessment of laboratory technology is a key role that also encompasses development and implementation of new technologies. Technology encompasses that used for performance of laboratory tests, delivery of results, and conversion of data into information.
6. Managing the Shift to Managed Care: Laboratory professionals play a key role in maintaining access to quality laboratory tests as our health care systems shift into it into a managed care environment. It was observed that in many locations, Medical Technologists were more aware of the implications of the shift to managed care than the Pathologist/Laboratory Director.

Future Roles of Laboratory Professionals:

1. Determine Clinical Utility and Appropriateness: Many in the health care industry feel that laboratory tests are used inappropriately, which encompasses both under- and over-utilization of tests. Workers in laboratory medicine will serve in a

leadership role in investigating the proper clinical use of laboratory tests as testing moves into more diverse locations.

2. Serve as Consultant on Selection and Interpretation of Tests: As health care resources become more limited and possibly more restrictive, rapid selection of the proper laboratory test or test strategy will become increasingly important. The laboratory professional will move from the passive role they now play in the direct laboratory work-up of a diagnosis and become an active player in the test selection process. They will achieve this goal through both direct consultation and by their influence on programmed ordering systems that will exist in either written practice guidelines or computer programs.
In this role they will help to optimize resource utilization in the diverse testing locations of the future. That movement will require careful management to insure limited health care funds are put into optimum use. The laboratory profession should be in a position to help decide what tests are done at what site for what purpose.

3. Assess Technology, Conduct Health-Services Research: To achieve these future roles, the laboratory profession must expand the current research efforts and understand laboratory processes better. These new research efforts must coordinate with existing efforts in the emerging area of health-

services research. Coordination must exist in terms of the manner in which the research is conducted and the topics studied. Joint projects with peers in other medical disciplines must occur on a regular basis.

4. Manage Testing in Non-traditional Settings: Future laboratory testing will no longer occur within the physical walls of a laboratory but will be done in many diverse locations. Some of these sites include point-of-care testing in hospital or home locations, increased self-testing by patients, and physician office laboratories, especially those of large clinics. The laboratory professional must be prepared to direct and manage the quality of testing in all sites and understand the differing performance needs of tests in non-traditional locations.
5. Manage Information System: Laboratories were one of the first non-financial areas of a hospital to embrace computers. That early experience has placed the laboratory professional as the key person in many institutions to work with the expanding needs of health care information. They will serve or lead the infrastructure now being developed toward the universal electronic record envisioned by our panelists.
6. Quality Assurance in Non-laboratory Areas: Organized quality assurance programs have always had a key role in the delivery of laboratory medicine. The understanding

laboratory professionals have in this process makes them a logical leader in the quality assurance programs in other health care areas.

Suggested Strategies and Methods

To achieve the future goals the laboratory profession must look into four areas: Health and Laboratory Information Systems; Assessment (analytical) Issues, Organization, and Guidelines. Research studies are required in all these areas to allow for an orderly evolution of the profession.

Health and laboratory information systems must integrate both vertically (across health care systems) and horizontally (within a health care system). To achieve these goals, we must increase our research in standardization of codes used by various systems and the grammar that defines the linkage of the codes. Of particular importance is the introduction of a Universal Patient Identifier which will uniquely identify a patient across all health care systems. These systems must have intelligence that will enable them to link various parts of the patient record and even to research literature. That intelligence should express itself in usable patient care guidelines.

A principal goal of near term Laboratory Focused Health Systems Research should be analytical and focus on the areas of assessment and data gathering. Our lack of even fundamental data in many areas of laboratory medicine leads to the high priority of these types of studies. We must start to aggregate existing data found in the dispirit computer systems found throughout our health care system. From these data we must develop ways, using the techniques developed in other areas of health services research, to determine the appropriateness of testing under various scenarios and the value

of testing as it applies both to individuals when they enter the health care system and the population to provide adequate information required by the public health system. Studies evaluating tests should include issues relating to clinical hazards, and benefits. Patient satisfaction must become an important consideration in evaluating tests, especially when alternate non-traditional testing sites, such as the home, are considered. All of these research topics must be studied using scientifically valid impact and process measures.

Delivery of laboratory medicine will change in the coming years and the profession must be prepared for that change. We will see changes in organization, both within an institution and throughout a health care delivery system that will reorganize the role of the laboratory. Laboratorians will now work more directly with providers and patients providing care instead of from the distance they now operate. This care will be delivered through many diverse locations including the traditional hospital and reference laboratories, point-of-care sites within institutions, home testing, self-testing, and extended care facilities. Our relationships with the vendors and manufacturers of our tools and supplies will change and develop into a closer partnership as both the economics and needs of the profession change. Compensation within the profession will change away from a cost-per-test basis to accommodate the changes developing between the deliverers of health care services and those paying for it. We must be prepared to monitor these changes and make sure they achieve the goal of enhancing efficiency.

Much of the future systems will derive from implementing care guidelines. It is felt that done carefully, these guidelines will

improve the delivery of care. Their development must include all areas of medicine, including the laboratory, as part of the core team. Teams developing guidelines should realize that medicine is practiced differently and successfully in many areas. Differences derive both from local practices and the differing philosophies of training programs. Any guideline that does not allow for local adaptation will fail to be adopted. Teams must also realize that practices change and the guidelines must also change to be successful. Hence, they must include monitoring steps to assure compliance and determine the need for change.

We expect the changes that will occur to derive from the development of multidisciplinary teams. Within a health care delivery system, these teams will include members from all areas of medicine. Within the profession of laboratory medicine, these teams will come from partnerships formed between laboratorians and laboratory equipment manufacturers, managed care organizations, pharmaceutical and other medical device manufactures, and academic medicine. The work of these teams will require funding from a variety of sources including the government, medical care payers, managed care organizations, and private funding from sources like foundations. All have a need for results from these research studies and in today's world of limited funding must be willing to share in the development costs.

Our discussion concluded with the clear message that laboratory focused health services research was required to move the profession forward. To better understand how to conduct the research programs, it was felt that we needed to introduce the principles of health services research into the training of laboratory professionals.

Introduction of that training would make the acceptance of the research programs by laboratorians more acceptable. Training will also help start the required movement by laboratorians outside of their traditional walls and into the total health care delivery system.